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Index terms:

Breast, biopsy, 00.1267
Breast neoplasms, diagnosis, 00.1267

Published online before print
10.1148/radiol.2282020910
Radiology 2003; 228:552-554

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Clip Migration within 8 Days of 11-gauge Vacuum-assisted Stereotactic Breast Biopsy: Case Report¹

A 49-year-old woman underwent 11-gauge vacuum-assisted stereotactic biopsy of a cluster of indeterminate calcifications in the left breast. A clip was deployed accurately at the biopsy site as confirmed on mammograms obtained immediately after biopsy. The patient returned 8 days later for additional stereotactic biopsies of the left breast. Repeat mammograms revealed that the clip deployed at the original biopsy site had migrated 5 cm inferiorly.

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Practitioners who perform stereotactic breast biopsies often choose to deploy a metallic clip near the biopsy site. This step is especially important when a malignant or high-risk lesion is entirely removed or becomes imperceptible after biopsy or when treatment involving neoadjuvant chemotherapy is planned. Misplacement of a clip is not uncommon, and it is usually noted immediately after the procedure. Two recent reports (1,2) describe clips that migrated within 10 months and 1 year of accurate placement. The purpose of this case report is to describe a clip that deviated from its original correct position at the biopsy site sometime within 8 days after the biopsy. Consultation with the institutional review board revealed that neither their approval nor informed consent was required for this case report.

1 Case Report

A 49-year-old woman underwent bilateral stereotactic core biopsies, first for a spiculated calcified mass in the right

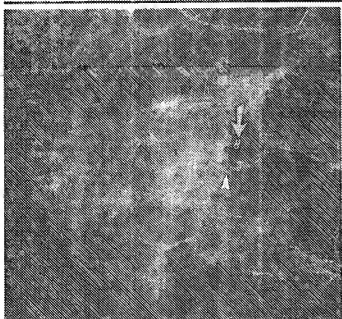
breast at the 2 o'clock position, then for indeterminate calcifications in the left breast at the 2 o'clock position 5 cm posterior to the nipple. The left breast biopsy was performed from a superior-to-inferior approach in the craniocaudal projection with an 11-gauge vacuum-assisted biopsy device (Mammotome; Biopsy/Ethicon EndoSurgery, Cincinnati, Ohio). No substantial bleeding occurred during or immediately after the procedure. A metallic clip (Gel Mark; SenoRx, Aliso Viejo, Calif) was placed because all of the calcifications were removed during the biopsy. The biopsy site marker applicator contains seven dehydrated gelatin foam pledgets, the fourth of which contains a metallic clip. The gelatin foam pledgets are resorbed in approximately 1-2 weeks. The method of placement was to insert the introducer into the biopsy probe and to deploy the gelatin foam pledgets in a slow and steady manner.

Postprocedural craniocaudal (Fig 1a) and true lateral (Fig 1b) mammograms were obtained to document clip position. The craniocaudal (the projection used for the biopsy) image was obtained first to aid in the possible detection of delayed accordion-effect clip movement (1). Mammograms demonstrated removal of the calcifications, a small air-filled biopsy cavity, and the clip at the biopsy site. Pathologic analysis of the left breast revealed an early radial scar. Concurrent biopsy of the right breast revealed an infiltrating ductal cell carcinoma with calcification. When the patient was given her diagnosis 1 day later, she did not report any pain, bleeding, or swelling at the biopsy sites.

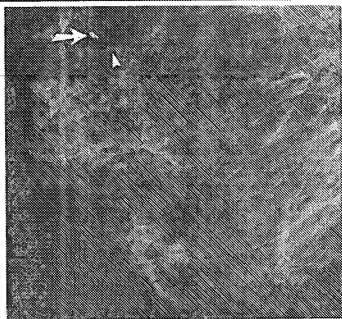
Given the contralateral malignancy of the right breast and the high-risk lesion in the left breast, the patient returned 8 days later for two additional biopsies of clusters of calcifications at separate sites in the left breast. The other procedures

Author contribution:
Guarantor of integrity of entire study,
A.T.H.

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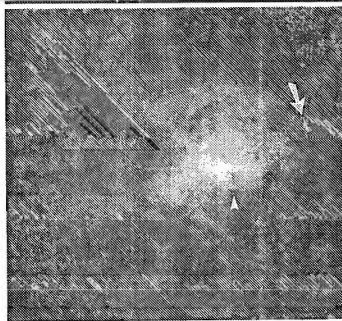


a.

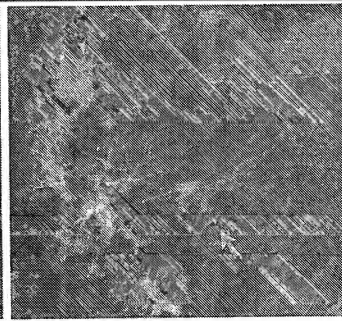


b.

Figure 1. (a) Craniocaudal and (b) true lateral postbiopsy mammograms show the clip (arrow) to be positioned correctly at the biopsy site, which is marked by an air-filled cavity (arrowhead).



a.



b.

Figure 2. (a) Craniocaudal and (b) true lateral mammograms obtained 8 days after biopsy show the clip (arrow) 5 cm inferior to the biopsy site, which demonstrates a hematoma (arrowhead).

were performed from lateral to medial for calcifications at the 1 o'clock position 10 cm posterior to the nipple and at the 5 o'clock position 14 cm posterior to the nipple. The postprocedural craniocaudal (Fig 2a) and true lateral (Fig 2b) mammograms demonstrated that the clip placed

accurately 8 days earlier had migrated 5 cm inferiorly and that a 1.5-cm-diameter hematoma was present.

The specimens obtained at the additional biopsies of the left breast were histologically benign. When the patient returned for needle localization, the original

biopsy site in the left breast, rather than the clip, was localized.

Discussion

It is not uncommon for small lesions to become obscured or even removed af-

ter biopsy; a tissue marker is of clinical importance in cases where the histologic findings are malignant or atypical. In patients receiving neoadjuvant chemotherapy, the lesion may shrink so much that it becomes unrecognizable, and clip placement is beneficial in the event that breast conservation surgery is performed. When several lesions are present, it is of value to mark the biopsy site to allow future identification of areas already sampled at biopsy.

Unfortunately, marker clip placements are not always accurate. Marker clip misplacements, which range from millimeters to several centimeters, after stereotactic vacuum-assisted biopsies have been reported in the literature; they are usually attributed to an accordion effect along the z axis when the breast is released from compression (3-5). Although the accordion effect is usually observed immediately after the procedure, a delayed accordion effect has been described (1) in which the first postbiopsy mammogram is orthogonal to the projection in which the biopsy was performed, and the clip migrates along the needle trajectory. Bleeding during or after the procedure may also contribute to deviation of the clip. In a letter to the editor, a clip was described that had extruded through a skin incision because of bleeding (6).

In this case, the clip migrated sometime within 8 days of the biopsy, possibly as a result of a hematoma that became evident on the follow-up mammogram. Although this case is unusual in that the hematoma was not present immediately,

nor was it clinically apparent 1 day later, a delayed hemorrhage is a possible explanation for the clip migration. Because the follow-up mammograms were obtained after the additional biopsies of the same breast, it could be argued that the delayed hematoma was caused by the added procedures. However, the incisions were at sites that were distant from the original location, the additional biopsies were performed in a different direction, and there was no clinical evidence of additional trauma to the original biopsy site. Therefore, it is unknown when the hematoma occurred or when the clip migrated. Other possible causes of the clip deviation include movement of the breast during everyday activities or resorption of the gelatin foam pledgets, which might allow an unanchored clip to move.

In this case, recognition of migration of the clip was crucial in the planning of the patient's subsequent needle localization procedure. Because of the large deviation from the original biopsy site, the clip was not localized. The original biopsy site was localized on the basis of landmarks within the breast that were noted on the prebiopsy mammogram. The pathology report of the excisional biopsy revealed hemorrhage.

In conclusion, clip migration, although uncommonly reported after documented accurate postbiopsy placement, is a practical concern, especially if needle localization is planned. To my knowledge, this case report is the first about clip migration that occurs after the immediate postbiopsy

period, as well as the only one to involve the Gel Mark biopsy site marker rather than the Micromark clip (Ethicon Endo-Surgery, Cincinnati, Ohio). For surgical cases in which marker clips are present, it is my opinion that repeat craniocaudal and true lateral mammograms should be obtained routinely on the day of needle localization, no matter how soon after biopsy the localization procedure is planned, because delayed clip migration could considerably change the clinical management and dramatically alter the path chosen for needle localization.

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